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(54) PRODUCTION OF MANGANESE DIOXIDE CRYSTAL

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain a crystal form according to the purpose by photoreducing permanganate ions in an aqueous solution of an alkali containing metal ions, providing colloidal particles of manganese oxide containing the metal ions in a one-dimensional tunnel or between layers and stirring the resultant particles in an aqueous solution under controlled conditions of pH, metal ion species, its concentration and temperature.

SOLUTION: An aqueous solution of an alkali contains ions of a metal selected from Li, Na, K, Sr, Rb and Ba. Light in an ultraviolet or a visible region is used for photoreduction. The resultant colloidal solution can be developed in, e.g. pure water and stirred at about 60-100°C for ≥1 hr under about neutral conditions to thereby provide a crystal of manganese dioxide containing K ions in a tunnel and having a length of several tens of nm. V5+ or V4+ ions preferably within the range of a monoatomic layer based on the surface area of colloidal particles can be added to thereby afford a crystal different in aspect ratio.

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1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] Permanganic acid ion in an alkali aqueous solution containing Me ion (metal ion with which Me is chosen from Li+, Na+, K+, Sr+, Rb+, and Ba+) is returned by irradiating light of ultraviolet or a visible region. A colloidal particle of manganese oxide which contains Me ion between a single dimension tunnel or a layer is produced. Subsequently, a manufacturing method of a manganese-dioxide crystal characterized by controlling gestalten, such as the crystal structure and an aspect ratio, by stirring this colloidal particle in an aqueous solution which controlled pH, Me ion kind, Me ion concentration, and temperature.
[Claim 2] Permanganic acid ion in an alkali aqueous solution containing Me ion (metal ion with which Me is chosen from Li+, Na+, K+, Sr+, Rb+, and Ba+) is returned by irradiating light of ultraviolet or a visible region. A colloidal particle of manganese oxide which contains Me ion between a single dimension tunnel or a layer is produced. Subsequently, a manufacturing method of a manganese-dioxide crystal characterized by controlling gestalten, such as an ASU ** KUTO ratio, by stirring in an aqueous solution which controlled pH, Me ion kind, Me ion concentration, and temperature after adding V5+ or V4+ which controlled concentration to this colloidal particle.
[Claim 3] About a crystal of a manganese dioxide manufactured by method of claim 1 or claim 2, it is Me ion (Me). Li+, Na+, K+, Sr+, Me ion produced by irradiating light of ultraviolet or a visible region and returning permanganic acid ion in an alkali aqueous solution containing a metal ion chosen from Rb+ and Ba+ is put into dispersion liquid of a colloidal particle of manganese oxide included between a single dimension tunnel or a layer. A manufacturing method of a manganese-dioxide crystal characterized by controlling a crystalline form by controlling and stirring pH and temperature.
[Claim 4] The microcrystal aggregate of a manganese dioxide characterized by having a gestalt which the crystal faces with the single dimension tunnel opening faced for which each other and connected as the crystal of manganese oxide manufactured by method of claim 1 or claim 2.
[Claim 5] A manufacturing method of a manganese hydroxide crystal characterized by becoming the precursor of a manganese-dioxide crystal which does not have tunnel structure by dipping in an acetone a colloidal particle and a manganese-dioxide crystal which are manufactured by method of claim 1 or claim 2.

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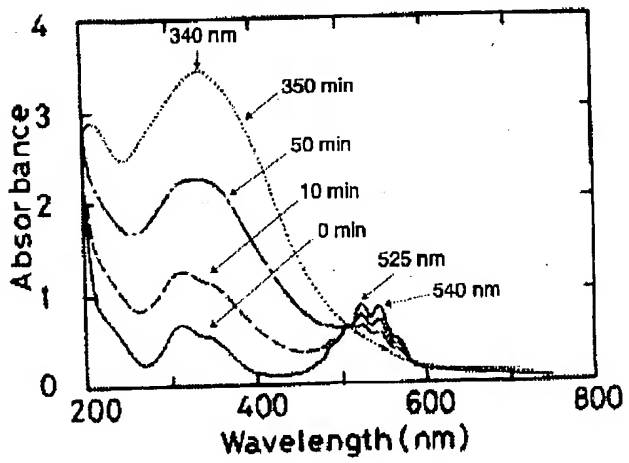
Drawing selection Representative drawing



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